WHAT IS CLAIMED IS:

1. A method of adjusting a spacing between a gas distribution member and a substrate support disposed generally opposite from the gas distribution member, the substrate support being configured to support a substrate on which to form a layer with improved thickness uniformity, the method comprising:

forming a layer on the substrate disposed on the substrate support;

measuring a thickness of the layer on the substrate;

calculating differences in thickness between a reference location on the substrate and a plurality of remaining locations on the substrate; and

computing spacing adjustment amounts for the remaining locations relative to the reference location based on the differences in thickness between the reference location and the remaining locations, the spacing adjustment amount being positive to increase the spacing between the substrate support at the location and the gas distribution member if the thickness is greater at the location than at the reference location, the spacing adjustment amount being negative to decrease the spacing between the substrate support at the location if the thickness is smaller at the location than at the reference location.

2. The method of claim 1 wherein the reference location and the remaining locations are evenly distributed angularly over the substrate.

3. The method of claim 1 wherein computing the spacing adjustment amounts comprises multiplying, the differences in thickness between the reference location and the remaining locations divided by a deposition time for forming the layer on the substrate, by a correlation factor previously determined to provide improved thickness uniformity for the layer.

4. The method of claim 3 wherein the correlation factor is proportional to a ratio of change in spacing divided by deposition thickness rate of the layer.

5. The method of claim 4 wherein the ratio of change in spacing divided by deposition rate thickness rate of the layer is obtained by:

forming a layer on a test substrate disposed on a test substrate support spaced from a gas distribution member by a first spacing;

measuring a first deposition thickness rate of the layer for the first spacing;

adjusting the test substrate support to be spaced from the gas distribution member by a second spacing;

forming a layer on another test substrate disposed on the test substrate support spaced from a gas distribution member by the second spacing;

measuring a second deposition thickness rate of the layer for the second spacing; and

dividing a difference between the first and second spacing by a difference between the first and second deposition thickness rate to obtain the ratio of change in spacing divided by deposition rate thickness rate of the layer.

6. The method of claim 3 wherein the correlation factor is equal to the ratio of change in spacing divided by deposition thickness rate of the layer, and multiplied by a correction factor.

7. The method of claim 6 wherein the correction factor is determined by obtaining the correlation factor experimentally and dividing the correlation factor by the ratio of change in spacing divided by deposition thickness rate of the layer.

8. The method of claim 7 further comprising determining the correlation factor by:

(a) forming a layer on a test substrate disposed on a test substrate support;

(b) measuring thickness of the layer on the test substrate;

(c) calculating differences in thickness between a reference location on the test substrate and a plurality of remaining locations on the test substrate corresponding to the reference location and remaining locations on the substrate, the reference location on the test substrate corresponding to the reference location on the substrate, the remaining locations on the test substrate corresponding to the remaining locations on the substrate;

(d) adjusting the spacing for the test substrate by test spacing adjustment amounts for the remaining locations relative to the reference location based on the differences in thickness between the reference location and the remaining locations, the spacing adjustment amount being positive to increase the spacing between the substrate support at the location and the gas distribution member if the thickness is greater at the location than at the reference location, the spacing adjustment amount being negative to decrease the spacing between the substrate support at the location if the thickness is smaller at the location than at the reference location;

(e) repeating steps (a)-(d) for another test substrate until a desired improved thickness uniformity of the layer is formed on the test substrate to obtain desired test spacing adjustment amounts; and

(f) dividing the desired test spacing adjustment amount by the difference in thickness for one of the remaining locations with respect to the reference location to determine the correlation factor.

9. The method of claim 8 wherein the reference location and the remaining locations are evenly distributed angularly over the substrate.

10. The method of claim 1 further comprising in situ adjusting the spacing by the computed spacing adjustment amounts for the remaining locations relative to the reference location.

11. The method of claim 1 wherein the gas distribution member comprises a faceplate.

12. The method of claim 11 wherein the spacing between the faceplate and the substrate support is less than about 0.1 inch.

13. An apparatus for adjusting a spacing between a gas distribution member and a substrate support, the apparatus comprising:

a processing chamber including a gas distribution member;

a substrate support disposed in the processing chamber and located generally opposite from the gas distribution member, the substrate support having a substrate support surface configured to support a substrate on which to form a layer;

a leveling plate coupled to the substrate support, the leveling plate including at least three measurement locations to mount a measuring device to measure distances between the leveling plate and a reference surface fixed with respect to the gas distribution member at each of the measurement locations; and

at least three adjustment members each coupled between the leveling plate and the reference surface, the at least three adjustment members being disposed at separate adjustment locations distributed over the leveling plate and independently adjustable to change positions of the leveling plate relative to the reference surface, thereby adjusting spacings between the substrate support surface and the gas distribution member at a plurality

of corresponding adjustment locations on the substrate support surface to modify a tilt of the substrate support surface with respect to the gas distribution member.

14. The apparatus of claim 13 wherein the separate measurement locations are each disposed adjacent one of the separate adjustment locations.

15. The apparatus of claim 13 wherein the leveling plate includes slots at the at least three measurement locations to temporarily mount the measurement device at each of the measurement locations.

16. The apparatus of claim 13 wherein the adjustment member comprises adjustment screws threadingly coupled to the leveling plate and having ends bearing against the reference surface of the processing chamber; and knurled lock nuts threadingly coupled to the adjustment screws and bearing against a surface of the leveling plate.

17. The apparatus of claim 13 wherein the leveling plate is generally parallel to the substrate support surface, and wherein the plurality of corresponding adjustment locations on the substrate support surface are generally aligned with the plurality of adjustment locations on the leveling plate.

18. The apparatus of claim 17 wherein the plurality of corresponding adjustment locations on the substrate support surface are uniformly distributed around the substrate support surface with respect to a center of the substrate support surface.

19. The apparatus of claim 13 wherein the reference surface is a bottom surface of the processing chamber.

20. The apparatus of claim 13 wherein the gas distribution member comprises a faceplate and the reference surface is generally parallel to the faceplate.